DISEASE AND MORTALITY PATTERN AMONG RURAL POPULATION OF JAGADHRI, DISTRICT YAMUNANAGAR, HARYANA, INDIA

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ABSTRACT

This study was conducted to assess the influence of foundry exposure on rural population of Jagadhri, district Yamunanagar, Haryana, India. For this purpose, mortality data of 10 years was studied from the official record (2001-10) of Christian Hospital Jagadhri, Haryana. In addition to this, five years mortality data from the Community Centre Chholi (a village in Jagadhri tehsil) was recorded. Data were collected in the month of November 2010 and was statically analyzed and presented in the form of tables. After analyzing the record, it was found that cardiac arrest and respiratory distress appeared to be the major mortality factor among men and women. Cardiac arrest was more prevalent in males, while respiratory distress was higher in females. The high incidence of respiratory distress leading to mortality may be due to air pollution in the area because of cropping practices, dust, and smoke. It was seen that poor families used firewood and cow dung cakes for cooking, which are smoke emitting fuels. These two conditions accounted for 74% of the mortality in women and 60% mortality in men over the period of 10 years. This study offers a platform for further socioeconomic class studies on the micro-community level that focus upon mortality pattern using a comparative approach.

KEYWORDS*: Disease Pattern, Environmental Stress, Healthcare, Mortality Rate, Socio-Economic Status*

INTRODUCTION

India is going through a rapid epidemiological transition (Paul and Singh 2017) with changes in disease and mortality pattern of its population from communicable diseases to non-communication diseases. Earlier, infectious and respiratory diseases were the major cause of death globally however chronic heart diseases, stroke and injuries are the leading cause of mortality in today's time. Various authors (Joshi et. al 2006; Dhak and Mutharayappa 2009; Nair et. al 2014) reported the similar trend in India but highlighted the scarcity of up-to-date, precise and reliable data on disease and mortality pattern in India particularly in rural areas. Mortality pattern is an important indicator of the health of any population in an area. Changes in the mortality pattern over time can facilitate policymakers to modify health system to tackle the main diseases prevailing in the population of that area. It is also an indicator that measures continue life-threatening environmental stress leading to the death of people living in the area.

Human health can be affected by the environment in a variety of ways. Many authors have studied the interaction between the environment and human health (Kjellen 2001; WHO 2006; Remoindou and Koundouri 2009). Environmental stress has been proven to affect human health directly or indirectly. Direct effect refers to the exposure of the population to harmful agents present in the environment whereas indirect effect refers to the disturbance of the life-sustaining ecosystem. World Health Organisation (2006) estimated that 13 million deaths annually are due to preventable environmental factors

only. The report also estimated that 24% of the global disease burden (healthy life years lost) and 23% of all deaths (premature mortality) was only due to environmental factors. Also, the environmental burden of disease is 15 times higher in developed countries than in developed countries, due to greater exposure to environmental risks and poor access to health care. Environmental degradation is caused by massive population growth and huge economic development based on industrialization and intensification of agriculture that are causing harmful effects on human health around the world.

Environmental risks in developing countries are closely associated with poverty and lack of basic human facilities such as access to safe drinking water, sanitation, public infrastructure and health care (Remoindou and Koundouri 2009). While analyzing the relationship between health and the environment, the quality of both indoor and outdoor environment should be measured. Outdoor environment refers to the quality of outside air, water, and soil whereas indoor environment refers to the indoor air and food quality with living and working conditions. There is also a strong relationship between the socio-economic status and human health and many authors (Williams 1999; Bhassuk et.al 2002; Hoffmann 2004) have assessed the impact of a socio-economic condition on health and mortality. People in poverty with low socio-economic status have generally two to three times higher death and mortality rates than rich people with high socio-economic status. Education, employment, and economic growth with improved health facilities and medicines have an inverse effect on the mortality rate. Good education, employment and better access to health facilities significantly increase the health status of the population and decline the mortality rates. The present study is one such exploration to assess the pattern of life-threatening diseases among the rural population of Jagadhri, district Yamunanagar, Haryana, India.

MATERIAL AND METHODS

The present study was conducted in district Yamunanagar of the North-Indian State of Haryana in 2010-11. District Yamunanagar came into existence on 1st November 1989, earlier the district was known as Abdullapur. It has an area of 1756 square kilometers, of which there are 655 villages, 10 towns, 2 tehsils and 4 sub-tehsils. A major part of the district lies under Shiwalik foothills and has a sub-tropical continental monsoon climate with seasonal rainfalls, hot summer, and cool winter adding great variations in the temperature. Sugarcane, wheat, and rice are its main crops. It is an important industrial town having metal, utensil and plywood industries. Large industries like Shri Gopal Paper Mills and Saraswati Sugar Mills (biggest Sugar mill in Asia) are also located here (https://yamunanagar.nic.in).

The present study endeavors to explore the pattern of disease and mortality among the rural population of Jagadhri town in District Yamunanagar. According to Census of India (2011), Jagadhri has a population of 124,894 of which male and female are 67,685 and 57,209 respectively. The sex ratio of Jagadhri is low with 845 females per 1000 males as compared to 879 that of Haryana. The average literacy rate of Jagadhri is 85.20% where the male and female literacy rate is 88.31% and 81.52% respectively. For the present study, data on illnesses leading to mortality over the 10years period (2001-10) was gathered from the official records of Christian Hospital Jagadhri which might indicate the general trend in the district. In addition to this, data on the death record for age, sex, and cause of death during the last five years from village Chholi was also collected. Chholi village is situated at 17km from Jagadhri. Three major caste groups residing in the Chholi village are Brahmins, Jats and Scheduled Castes. Jats are primarily engaged in agriculture and most of them depend on agriculture for their livelihood. Brahmins are also engaged in agriculture with some members of this community taking up other services. On the other hand, Scheduled Castes do not possess enough land for agriculture. They are engaged in trades like barbers, cobblers and other small laborer activities. In order to find basic information about the

village, data from school and Anganbadi centre was also collected as the secondary source of data. Assistance for this was received from Government Middle School Chholi and Anganbadi Centre Chholi. From the school and Anganbadi records (2010) it is observed that village Chholi has the total number of 389 households, comprising of 140 Schedule Caste, 120 Brahmins, 110 Jats and 19 others households in the whole village. The major communities are Scheduled Castes, Brahmins and Jats in the order of the preponderance of the number of households. Data were collected in the month of November 2010 and was statically analyzed and presented in the form of tables.

RESULTS

The disease incidences particularly leading to mortality are presented in Table No. 1 to 3. While Table No. 1 includes data over 10 years period gather from the record of Christian Hospital Jagadhri and may indicative of the trend in the district. Table No.2 presents a five-year data taken from the mortality record of Non- Scheduled Caste communities of Chholi village and is specific to mortality and age at death and cause of mortality in that village. Looking at the district, cardiac arrest and respiratory distress appear to be the major mortality factors in men and women. While cardiac arrest is more prevalent in males, respiratory distress is higher in females than in males. The high incidence of respiratory leading to mortality may be because of air pollution in the area due to cropping pattern, dust and smoke pollution in the houses. There is no significant difference for mean age at death between the two sexes.

Table 1: Total Numbers of Deaths and the Average Age at Death (in Years)
Christian Hospital Jagadhri, Haryana (2000-11)

	Males			Females		
	N (%)	Mean Age at Death (yrs)	S.D.	N (%)	Mean Age at Death (yrs)	S.D.
Cardiac Arrest	61 (39.20)	58.45	16.70	38 (42.69)	56.73	21.02
Respiratory Attack	31 (20.26)	59.16	17.30	28 (31.46)	59.67	16.88
Severe Anemia	16 (10.45)	34.37	32.06	5 (5.61)	39.00	34.54
Accidental Injuries	19 (12.41)	39.31	13.47	6 (6.74)	25.33	16.02
Other Diseases	26 (16.99)	58.19	19.50	12 (13.48)	56.75	21.37
Total	**153**			**89**		

Table 2: Total No. of Deaths and the Average Age at Death (in years) of
Non-S.C. Communities of Chholi Village (2005-10)

	Males			Females		
	N (%)	Mean Age at Death (yrs)	S.D.	N (%)	Mean Age at Death (yrs)	S.D.
Cardiac Arrest	17 (40.48)	58.23	16.03	7 (41.17)	70.85	17.38
Respiratory Attack	8 (19.05)	62.75	19.01	6 (35.29)	61.66	20.17
Severe Anemia	2 (3.38)	48.50	3.50	----	----	----
Accidental Injuries	8 (19.05)	39.00	11.05	3 (17.65)	30.66	11.44
Other Diseases	7 (16.67)	58.85	13.90	1 (5.88)	85.00	0.00
Total	**47**			**17**		

Table 3: Total No. of Deaths and the Average Age at Death (In Years) of S.C. of Chholi Village (2005-09)

	Males			Females		
	N (%)	Mean Age at Death (Yrs)	S.D.	N (%)	Mean Age at Death (Yrs)	S.D.
Cardiac Arrest	1 (6.67)	40.00	0.00	1 (10.00)	70.00	0.00
Respiratory Attack	5 (33.33)	58.00	12.08	7 (70.00)	55.42	20.43
Severe Anemia	5 (33.33)	2.20	2.40	----	----	----
Accidental Injuries	1 (6.67)	29.00	0.00	2 (20.00)	7.50	4.50
Other Diseases	3 (20.00)	37.66	24.85	----	----	----
Total	15			10		

Looking at the village record for Non-Scheduled Caste communities generally, the pattern appears to be the same but males showing a high incidence to death due of accidental injuries. In the village, females have a very high incidence of death due to respiratory problems as compared to males. This could be attributed to smoke pollution. As far as Scheduled Caste community is concerned (Table No.3) in Chholi village the mortality is highest due to respiratory distress which is indicative of exposure to smoke pollution as a consequence of poor living conditions.

DISCUSSIONS

Illnesses leading to mortality were determined from hospital record of Jagadhri as well as community records at the village. The hospital records which may reflect the general trend in district and nearby region indicate a high mortality as a consequence of cardiac conditions. Proportionately these figures are higher in females than in males. This may not be entirely expected given that, in this area, there is a strong preference for food with high-fat content and the general lack of extensive physical activity in females who appears to be confined to houses. Mortality due to respiratory distress is also high being higher in females than in males. The general dusty conditions and various air pollutants as a result of agricultural activities along with smoke pollution as a result of cooking within the houses may be a strong contributing factor. It was seen that poorer families used firewood and cow dung cake for cooking which is smoke emitting fuels. These two conditions account for 74% of the mortality in women and 60% mortality in men over ten years period.

When we look at the cause of the mortality among Non-Scheduled Caste communities resident in Chholi village over a 5 year period, the picture is generally the same. Cardiac and respiratory distresses are the major causes of mortality. Significantly, respiratory distress is much more in women than in men, again this may be attributable to smoke pollution due to food preparation and other activities in the houses. Just like in the case of the picture of the district as a whole discussed above, these two conditions of cardiac and respiratory distress account for 59% of the mortality in males and 77% mortality in females.

Over the same period, the mortality among the Scheduled Caste community presents a different picture. 70% of the females died due to respiratory distress, whereas only 33% of the males showed mortality due to the same factor. Again this may indicate exposure to smoke and air pollutions. The absence of rich nutrition along with engagement in physical labor is reflecting in the cause of mortality. There is a low mortality due to cardiac condition but high mortality in males due to anemia. Therefore, those populations in the lower end of the socio-economic scales are distress by a very different factor than the population at the higher end of the socio-economic scale. Any future studies on micro-communities that

focus upon mortality need to study mortality patterns with respect to socio-economic class.

CONCLUSIONS

The present study was an exploration to understand the various environmental factors affecting disease and mortality. Causes of mortality differed with the caste. Non-Scheduled Caste communities in the village reflect the picture in the district wherein cardiac arrest and respiratory factors were major causes of mortality. The Scheduled Caste suffered mainly from respiratory factors that may be attributable to air pollution. It is suggested that micro-level studies in the area of medical anthropology pay particular attention to caste, class and disease-specific causes of mortality and modes to obtain relief in those contexts. This work offers a platform for further socio-economic class studies on the micro-community level that focus upon mortality patterns using a comparative approach.

ACKNOWLEDGEMENT

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